



Aerosolized red-tide toxins (brevetoxins) and asthma

Author(s): Fleming LE, Kirkpatrick B, Backer LC, Bean JA, Wanner A, Reich A, Zaias J, Cheng YS, Pierce R, Naar J, Abraham WM, Baden DG
Year: 2007
Journal: Chest. 131 (1): 187-194

Abstract:

BACKGROUND: With the increasing incidence of asthma, there is increasing concern over environmental exposures that may trigger asthma exacerbations. Blooms of the marine microalgae, *Karenia brevis*, cause red tides (or harmful algal blooms) annually throughout the Gulf of Mexico. *K. brevis* produces highly potent natural polyether toxins, called brevetoxins, which are sodium channel blockers, and possibly histamine activators. In experimental animals, brevetoxins cause significant bronchoconstriction. In humans, a significant increase in self-reported respiratory symptoms has been described after recreational and occupational exposures to Florida red-tide aerosols, particularly among individuals with asthma.

METHODS: Before and after 1 h spent on beaches with and without an active *K. brevis* red-tide exposure, 97 persons >orEuro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 12 years of age with physician-diagnosed asthma were evaluated by questionnaire and spirometry. Concomitant environmental monitoring, water and air sampling, and personal monitoring for brevetoxins were performed. **RESULTS:** Participants were significantly more likely to report respiratory symptoms after *K. brevis* red-tide aerosol exposure than before exposure. Participants demonstrated small, but statistically significant, decreases in FEV(1), midexpiratory phase of forced expiratory flow, and peak expiratory flow after exposure, particularly among those participants regularly using asthma medications. No significant differences were detected when there was no Florida red tide (ie, during nonexposure periods). **CONCLUSIONS:** This study demonstrated objectively measurable adverse changes in lung function from exposure to aerosolized Florida red-tide toxins in asthmatic subjects, particularly among those requiring regular therapy with asthma medications. Future studies will assess these susceptible subpopulations in more depth, as well as the possible long-term effects of these toxins.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2683400>

Resource Description

Exposure : ☒

weather or climate related pathway by which climate change affects health

Food/Water Quality, Meteorological Factors, Temperature

Food/Water Quality: Biotoxin/Algal Bloom

Temperature: Fluctuations

Geographic Feature: ☒

Climate Change and Human Health Literature Portal



resource focuses on specific type of geography

Ocean/Coastal

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Respiratory Effect

Respiratory Effect: Asthma

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Children

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified